MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

T1, 2019/ 2020

BDM7124 – DATABASE MANAGEMENT

(All Sections/ Groups)

30 SEPTEMBER 2019
9.00 a.m – 12.00 p.m
(3 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 4 pages (including this cover page) with **FOUR** questions.

2. Answer **ALL** questions. Distribution of the marks for each question has been provided.

3. Answers should be written in the **Answer Booklet** provided.

Question 1

Suppose we have a ternary relationship **R** between entity sets A, B and C such that A has a key constraint and total participation and B has a key constraint; these are the only constraints.

a) A has attributes a1 and a2, a1 being the key; B and C are similar. **R** has no descriptive attributes. Write SQL statements to create these tables in order to capture as many constraints possible. (18 marks)
(**Note:** Correct entity definition: 8 marks, attribute and association with correct cardinality constraints: 10 marks)

b) Can all constraints be captured? Why or why not? (7 marks)

(Total: 25 marks)

Question 2:

The following questions are based on the relational schema below:
Flights:
flno:integer,from:string,to:integer,distance:integer,departs:time,arrives:time,price:integer
Aircraft: aid:integer,aname:string,cruisingrange:integer
Certified: eid: integer, aid:integer
Employees: eid: integer,ename:string,salary:integer

Note that the Employee relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL:

a) Find the names of aircraft such that all pilots certified to operate them earn more than RM250,000. (5 marks)

b) For each pilot who is certified for more than 10 aircrafts, find the *eid* and the maximum *cruisingrange* of the aircraft that he (or she) is certified for. (5 marks)

c) Find the names of pilots who earn a salary less than the price of the cheapest route from Washington DC to New York. (5 marks)

d) Find all the aircraft with a *cruisingrange* over 15,000 miles, find the name of the aircraft, maximum salary of all pilots certified for this aircraft. (5 marks)

e) Find the names of pilots certified for some Boeing aircraft. (5 marks)

(Total: 25 marks)
Continued .....

Question 3:

The Jonesburgh County Basketball Conference (JCBC) is an amateur basketball association. Each city in the county has one team as its representative. Each team has a maximum of 12 players and a minimum of 9 players. Each team also has up to three coaches (offensive, defensive, and physical training coaches). During the season, each team plays two games (home and visitor) against each of the other teams. A game can be played by one team but two teams should be in the play and can play many games. A city sponsors a team and teams have a minimum of 9 and maximum of 12 players each. A team is also coached by many coaches.

Given those conditions, do the following:

a. Identify the connectivity of each relationship. (5 marks)
b. Identify the type of dependency that exists between CITY and TEAM. (5 marks)
c. Identify the cardinality between teams and players and between teams and city. (5 marks)
d. Identify the dependency between coach and team and between team and player. (5 marks)
e. Draw an ERD to represent the JCBC database. (5 marks)

(Total: 25 marks)

Question 4:

The following questions are based on the relational schema below:
Emp (eid:integer,ename:string,age:integer,salary:real)
Works (eid:integer,did: integer,pct_time:integer)
Dept (did: integer, dname:string,budget:real,managerid:integer)

a) Give an example of a foreign key constraint that involves Dept. How would you enforce a constraint when a user attempts to delete a Dept tuple? (5 marks)

b) Write an SQL statement to create the above relations including appropriate versions of all primary and foreign key integrity constraints. (10 marks)

c) Write an SQL statement to add "John Doe" as an employee with eid = 208, age =35 and salary = 25,000. (5 marks)

d) Write an SQL statement to give every employee a 50% raise in salary. (5 marks)

(Total: 25 marks)

END OF EXAM QUESTIONS